

SEQUENCE LISTING

<110> Chan, Chung
Zamost, Bruce L.
Covert, Douglas C.
Liu, Hong Y.
De Jongh, Karen S.
Meyer, Jeffrey D.
Holderman, Susan D.

<120> IL-21 PRODUCTION IN PROKARYOTIC HOSTS

<130> 02-12

<160> 42

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 642
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (47)...(535)

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1

agt cct ggc aac atg gag agg att gtc atc tgt ctg atg gtc atc ttc 103
Ser Pro Gly Asn Met Glu Arg Ile Val Ile Cys Leu Met Val Ile Phe
5 10 15

ttg ggg aca ctg gtc cac aaa tca agc tcc caa ggt caa gat cgc cac 151
Leu Gly Thr Leu Val His Lys Ser Ser Ser Gln Gly Gln Asp Arg His
20 25 30 35

atg att aga atg cgt caa ctt ata gat att gtt gat cag ctg aaa aat 199
Met Ile Arg Met Arg Gln Leu Ile Asp Ile Val Asp Gln Leu Lys Asn
40 45 50

tat gtg aat gac ttg gtc cct gaa ttt ctg cca gct cca gaa gat-gta	247		
Tyr Val Asn Asp Leu Val Pro Glu Phe Leu Pro Ala Pro Glu Asp Val			
55	60	65	
gag aca aac tgt gag tgg tca gct ttt tcc tgt ttt cag aag gcc caa	295		
Glu Thr Asn Cys Glu Trp Ser Ala Phe Ser Cys Phe Gln Lys Ala Gln			
70	75	80	
cta aag tca gca aat aca gga aac aat gaa agg ata atc aat gta tca	343		
Leu Lys Ser Ala Asn Thr Gly Asn Asn Glu Arg Ile Ile Asn Val Ser			
85	90	95	
att aaa aag ctg aag agg aaa cca cct tcc aca aat gca ggg aga aga	391		
Ile Lys Lys Leu Lys Arg Lys Pro Pro Ser Thr Asn Ala Gly Arg Arg			
100	105	110	115
cag aaa cac aga cta aca tgc cct tca tgt gat tct tat gag aaa aaa	439		
Gln Lys His Arg Leu Thr Cys Pro Ser Cys Asp Ser Tyr Glu Lys Lys			
120	125	130	
cca ccc aaa gaa ttc cta gaa aga ttc aaa tca ctt ctc caa aag atg	487		
Pro Pro Lys Glu Phe Leu Glu Arg Phe Lys Ser Leu Leu Gln Lys Met			
135	140	145	
att cat cag cat ctg tcc tct aga aca cac gga agt gaa gat tcc tga	535		
Ile His Gln His Leu Ser Ser Arg Thr His Gly Ser Glu Asp Ser *			
150	155	160	
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Asp Arg His Met Ile Arg Met Arg Gln Leu Ile Asp Ile Val Asp Gln			
35 40 45			

Leu Lys Asn Tyr Val Asn Asp Leu Val Pro Glu Phe Leu Pro Ala Pro
50 55 60
Glu Asp Val Glu Thr Asn Cys Glu Trp Ser Ala Phe Ser Cys Phe Gln
65 70 75 80
Lys Ala Gln Leu Lys Ser Ala Asn Thr Gly Asn Asn Glu Arg Ile Ile
85 90 95
Asn Val Ser Ile Lys Lys Leu Lys Arg Lys Pro Pro Ser Thr Asn Ala
100 105 110
Gly Arg Arg Gln Lys His Arg Leu Thr Cys Pro Ser Cys Asp Ser Tyr
115 120 125
Glu Lys Lys Pro Pro Lys Glu Phe Leu Glu Arg Phe Lys Ser Leu Leu
130 135 140
Gln Lys Met Ile His Gln His Leu Ser Ser Arg Thr His Gly Ser Glu
145 150 155 160
Asp Ser

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<210> 4

<211> 42

<212> DNA

<213> Artificial Sequence

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<223> oligonucleotide ZC29741

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tctgatttaa tctgtatcg gctgaaaatc ttatctcatc cg 42

<210> 5

<211> 62

<212> DNA

<213> Artificial Sequence

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<223> oligonucleotide ZC29736

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cc 62

<210> 6

<211> 63

<212> DNA

<213> Artificial Sequence

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<223> oligonucleotide ZC29738

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ttc 63

<210> 7

<211> 62

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<213> Artificial Sequence

<220>

<223> oligonucleotide ZC29084

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tg 62

<210> 8

<211> 68

<212> DNA

<213> Artificial Sequence

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<223> oligonucleotide ZC22127

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gtgttcta 68

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<223> oligonucleotide ZC22963	
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<210> 17
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<210> 18
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<223> oligonucleotide ZC22966

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<210> 19
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<223> oligonucleotide ZC22967

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<210> 20
<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC22968

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<210> 21

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<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC22969

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<210> 22

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC22970

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<210> 23

<211> 60

<212> DNA

<213> Artificial Sequence

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<223> oligonucleotide ZC22971

<400> 23

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<210> 24

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC22972

<400> 24

ttaatctgta tcaggctgaa aatcttatct catccgccaa 40

<210> 25

<211> 63

<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC40133

<400> 25

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ctg 63

<210> 26

<211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC40107

<400> 26

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<210> 27

<211> 405

<212> DNA

<213> Artificial Sequence

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<223> optimized IL-21

<221> CDS

<222> (1)...(405)

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att gtt gat cag ctg aaa aat tat gtg aat gac ctg gtt ccg gaa ttc 96
Ile Val Asp Gln Leu Lys Asn Tyr Val Asn Asp Leu Val Pro Glu Phe
20 25 30

ctg ccg gct ccg gaa gat gtt gag acc aac tgt gag tgg tcc gct ttc 144
Leu Pro Ala Pro Glu Asp Val Glu Thr Asn Cys Glu Trp Ser Ala Phe
35 40 45

tcc tgt ttc cag aaa gcc cag ctg aaa tcc gca aac acc ggt aac aac 192
Ser Cys Phe Gln Lys Ala Gln Leu Lys Ser Ala Asn Thr Gly Asn Asn
50 55 60

gaa cgt atc atc aac gtt tcc att aaa aaa ctg aaa cgt aaa ccg ccg 240
Glu Arg Ile Ile Asn Val Ser Ile Lys Lys Leu Lys Arg Lys Pro Pro
65 70 75 80

tcc acc aac gca ggt cgt cgt cag aaa cac cgt ctg acc tgc ccg tcc 288
Ser Thr Asn Ala Gly Arg Arg Gln Lys His Arg Leu Thr Cys Pro Ser
85 90 95

tgt gat tct tat gag aaa aaa ccg ccg aaa gaa ttc ctg gaa cgt ttc 336
Cys Asp Ser Tyr Glu Lys Lys Pro Pro Lys Glu Phe Leu Glu Arg Phe
100 105 110

aaa tcc ctg ctg cag aaa atg att cac cag cac ctg tcc tct cgt acc 384
Lys Ser Leu Leu Gln Lys Met Ile His Gln His Leu Ser Ser Arg Thr
115 120 125

cac ggt tcc gaa gat tcc tga 405
His Gly Ser Glu Asp Ser *
130

<210> 28
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<212> PRT
<213> Artificial Sequence

<220>
<223> optimized IL-21

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Leu Pro Ala Pro Glu Asp Val Glu Thr Asn Cys Glu Trp Ser Ala Phe
35 40 45
Ser Cys Phe Gln Lys Ala Gln Leu Lys Ser Ala Asn Thr Gly Asn Asn
50 55 60
Glu Arg Ile Ile Asn Val Ser Ile Lys Lys Leu Lys Arg Lys Pro Pro
65 70 75 80
Ser Thr Asn Ala Gly Arg Arg Gln Lys His Arg Leu Thr Cys Pro Ser
85 90 95
Cys Asp Ser Tyr Glu Lys Lys Pro Pro Lys Glu Phe Leu Glu Arg Phe
100 105 110
Lys Ser Leu Leu Gln Lys Met Ile His Gln His Leu Ser Ser Arg Thr
115 120 125
His Gly Ser Glu Asp Ser
130

<210> 29
<211> 64
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide ZC43,586

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acaatttcac acagaattca ttaaagagga gaaattaact atggatatta atactgaaac 60
tgag 64

<210> 30

<211> 64
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide ZC43,587

<400> 30
tctgtatcag gctgaaaatc ttatctcatc cgccaaaaca tcatcgccat tgctcccaa 60
atac 64

<210> 31
<211> 1965
<212> DNA
<213> Artificial Sequence

<220>
<223> DNA sequence of the Red Recombinase operon
amplified with ZC43,586 and ZC43,587

<400> 31
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agaggcagaa ctggcagacg acatggaaaa aggcctgccc cagcacctgt ttgaatcgct 300
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cctgataagc agaatggcat cgttccgtg gtgggcgtt atggctggtc ccgcatcatc 720
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tcatcgaaaa aatggacgag gcactggctg aaattggttt tgtatttggg gagcaatggc 1920
gatgatgttt tggcggatga gataagattt tcagcctgat acaga 1965

<210> 32

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<212> DNA

<213> Artificial Sequence

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<223> oligonucleotide ZC45,112

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gttggcggttc tcaggtcgag gtggcccgcc tc 92

<210> 33

<211> 99

<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC45,171

<400> 33

taattgactc attaagttag atataaaaaa tacatattca atcattaaaa cgattgaatg 60
gagaactttt attattgaag catttatcag gtttattgt 99

<210> 34

<211> 1591

<212> DNA

<213> Artificial Sequence

<220>

<223> Tetracycline promoter::tetracycline gene

(tetp::tet) PCR fragment amplified with ZC45,112
and ZC45,171

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gagaactttt attattgaag catttatcg ggttattgtc tcatgagcg atacatattt 120
gaatgtattt agaaaaataa acaaataagg gttccgcgc aatttccccg aaaagtgc 180
cctgacgtct aagaaaccat tattatcatg acattaacct ataaaaatag gcgtatcac 240
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aaaaatttc cccgaggtga aaatcgcccc 1560
gggaaataac tagccatttc aatgtaaaca 1591

<210> 35

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> oligonucleotide ZC45,357

<400> 35

tcattaaagg agatataaaaa aatacatattt ca

32

<210> 36
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide ZC45,350

<400> 36
taattgttac attgaaatgg ctagttatt 29

<210> 37
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide ZC45,353

<400> 37
atgaaatcta acaatgcgct catcgtc 27

<210> 38
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide ZC45,355

<400> 38
tcaggtcgag gtggccggc tc 22

<210> 39
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide ZC45,354

<400> 39
tctaccgaga ctttatcggt tactcct 27

<210> 40
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide ZC45,359

<400> 40
ttaaaatgt tacttaagac cagcagta

28

<210> 41
<211> 1585
<212> DNA
<213> Artificial Sequence

<220>
<223> Sequence of the 1584bp PCR fragment amplified with
primer set #1 (ZC45,357 and ZC45,350)

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ttattattga agcatttatac agggttattg tctcatgagc ggatacatat ttgaatgtat 120
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cggaaatgc cacctgacgt 180
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccttc 240
tcatgttga cagtttatca tcgataagct ttaatgcgtt agtttatcac agttaaattg 300
ctaacgcagt caggcaccgt gtatgaaatc taacaatgcg ctcatcgtca tcctcggcac 360
cgtcaccctg gatgctgttag gcataggctt ggttatgccc gtactgccg gcctcttgcg 420
ggatatcgctc cattccgaca gcatcgccag tcactatggc gtgctgctag cgctatatgc 480
gttcatgcaa tttctatgcg cacccttgcg cggagcactg tccgaccgct ttggccgccc 540
cccagtccctg ctcgcttcgc tacttggagc cactatcgac tacgcgatca tggcgaccac 600
acccgtccctg tggatccctc acgccggacg catcggtggcc ggcattcaccg gcccacagg 660
tgcgggtgcg ggcgcctata tcgcccacat caccgatggg gaagatcggtt ctcgcccatt 720
cgggctcatg agcgcttgcgatg tcggcgatggg tatggatggca ggccccgtgg ccggggact 780
gttggcgcc atctccctgc atgcaccatt ccttgcggcg gcggtgctca acggcctcaa 840
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cgcacttatg actgtcttgc ttatcatgc actcgtagga caggtgccgg cagcgctctg 1020
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ggtattcgga atcttcacg ccctcgatca agccttcgtc actggatggcc ccacccaaacg 1140
tttggcgag aagcaggcca ttatgcggcc catggcgcc gacgcgtgg gctacgttgc 1200
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ggcacagctt caaggatcgc tcgcggctct taccagccta acttcgatca ctggaccgct 1380
gatcgacacg gcgatttatg ccgcctcggc gagcacatgg aacgggttgg catggattgt 1440
aggcgccgccc ctatacccttgc tctgcctccc cgcgttgcgt cgcgtgcata ggagccggc 1500
cacctcgacc tgagaacgcc aactaaaatt tccccgaggt gaaaatcgcc ccggggaaata 1560
actagccatt tcaatgtaac aatta 1585

<210> 42

<211> 1191

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence of the 1190bp PCR fragment amplified
with primer set #2 (ZC45,353 and ZC45,355)

<400> 42

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